
RIA

Pre-Operations

&

Operations

Estimates

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Pre-Operations Cost Model

- **TEC covers scope of work for:**
 - **Design**
 - **Fabrication**
 - **Installation**
 - **Preliminary equipment testing**
- **TEC does NOT cover such elements as:**
 - **Element, subsystem, & system commissioning**
 - **Infant mortalities**
 - **Utilities and supplies costs**
- **Pre-operations costs required to cover non-TEC costs**
 - **Begins when first elements installed**
 - **Ends at beginning of operations**
 - Last year carries virtually all operation's functions
Last year support level nearly that of operations

Pre-operations Costing Procedure

- **Develop estimate of construction schedule**
 - **Estimate probable equipment implementation**
 - Defines beginning of Pre-operations support
 - Provides guidance for incremental Pre-operations support
- **Develop estimate of Operations cost**
 - **Defines basis for final year Pre-operations support**
 - Pre-operations during last year of construction must support virtually all Operations activities

Operations Cost Procedure

- **Model**

- **Personnel Costs**

- 150 k\$/FTE

- Assumed to include indirects such as procurement, janitorial services, and human resource group

- **Procurement Costs**

- Utilities (Electricity @ 5 cents/kwhr)
 - General stores and supplies
 - Equipment replacement costs
 - Facility efficiency and productivity improvements

- **Two major groups**

- Accelerator facility including beam delivery to experimental areas
 - Experimental areas

- **Estimates**

- **Bottoms up estimate of requirements based on facility functions**
 - **Scaling from or comparison to existing facilities**
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RIA Facility

- **≈ 1.5 GV SC Linacs (Driver & Reaccelerator)**
- **BSY**
- **High Radiation Production Area**
- **Experimental Areas**
 - **Lower Energy Area**
 - Ion Traps, Laser facility, Isotope collection
 - Recoil Separator & Silicon Array
 - γ ray array, Recoil Separator, Spectrometer, Gas-filled spectrometer, Silicon Array, User's Line
 - **Higher Energy Area**
 - Spectrometer, TPC, Silicon Array, Sweeper Magnet, Decay Station, γ ray Array

The diagram illustrates the layout of the High Energy Facility. Key components include:

- Linac:** A long, straight structure on the left side, labeled "Linac".
- Target Facility:** A complex structure at the top, labeled "Target Facility".
- ISOL Facility:** A complex structure on the right, labeled "ISOL Facility".
- Office Building:** A cluster of buildings at the bottom, labeled "Office Building".
- Linac Switchyard:** A central area labeled "Linac Switchyard".
- High Energy Facility:** The overall complex, labeled "High Energy Facility".

A scale bar indicates distances in Feet (0, 100, 200) and Meters (0, 50).

Accelerator Operations Group

- **Supports Operation of**
 - **Driver Linac system**
 - **Post-acceleration Linac system**
 - **Beam switch yard to target production area**
 - **Beam transport from target production area**
- **Supports maintenance of all magnetic elements and their controls & power supplies**
- **General support functions**
 - **Mechanical engineering and machine shop**
 - **Safety**

Accelerator Operations

Area	FTE
Accelerator Operations	
Accelerator Physics	15
Cryogenics	20
Vac., Alignment, Installation	20
SRF	15
Controls & Electronics	30
Control Room Staff	25
Ion Sources	5
RF	30
Safety	30
ME & Mach. Shop	25
Maintenance	15
Total	230

- **Personnel Costs \approx 34.5 M\$**
 - **Electrical \approx 7 M\$**
 - **Procurements \approx 6.5 M\$**
 - \approx 1.5 M\$ cryogenics
 - Equipment based (\approx 5 M\$)
 - Replacement, improvement, & new capability
 - **Total Accelerator Operations \approx 48 M\$**
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Experimental Facilities Group

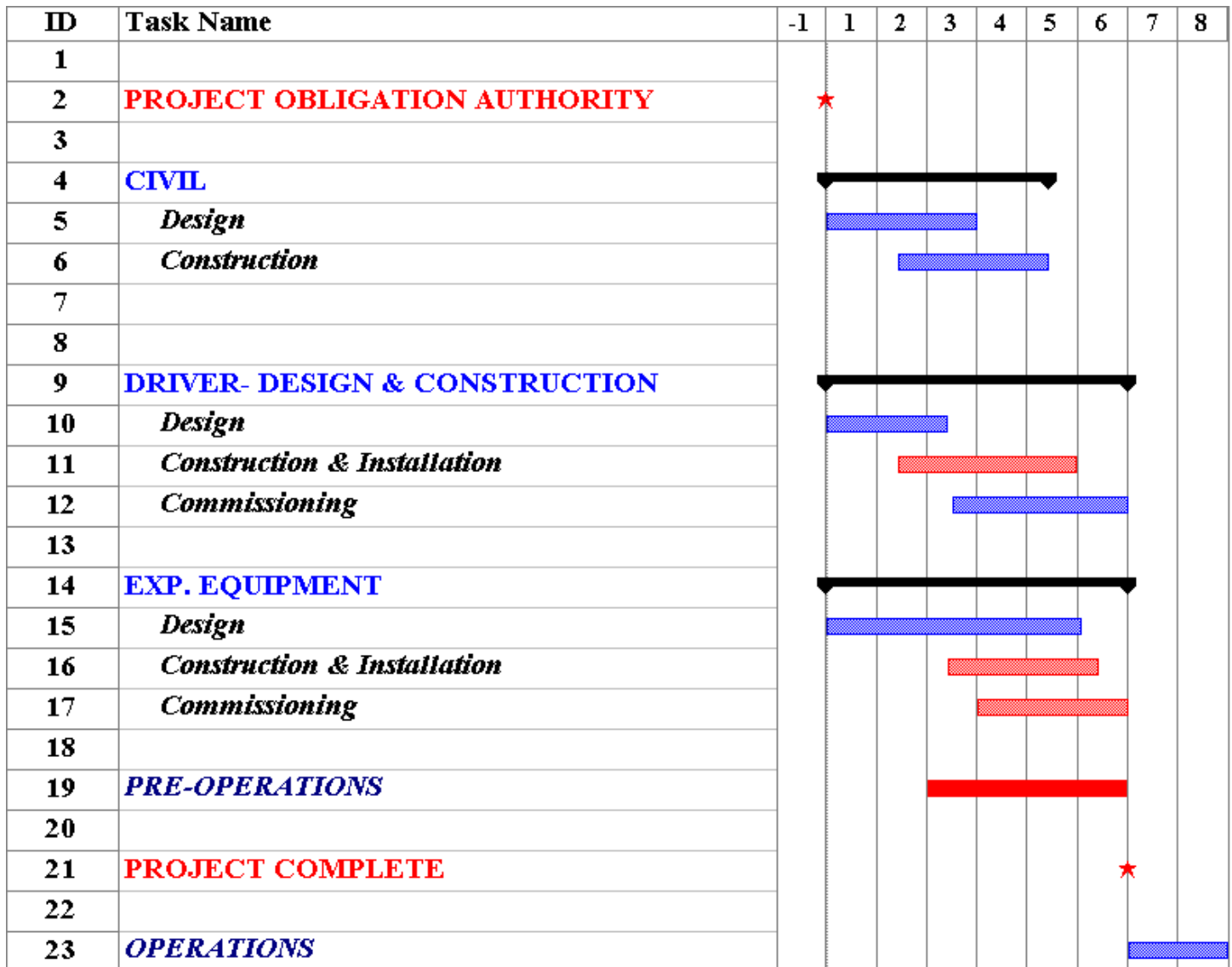
- **Supports experimental areas including**
 - **Production Targets**
 - **ISOL beam development & delivery**
 - **Fast beam development & delivery**
 - **He gas stopping system**
 - **Experimental apparatus**
 - **Nuclear physics targets, detectors, electronics, data acquisition**
 - **Radioactive beam production, identification, & delivery**

Experimental Facility Operations

Area	FTE
Experimental Operations	
Staff	30
Installation & Systems Support	15
Control, Diag., & Data Acquisition	10
Detectors, N. Electronics, Targets	10
User Services	5
Post Docs	20
Total	90

- **Personnel Cost \approx 13.5 M\$**
- **Procurements \approx 3.5 M\$**
 - **Equipment based**
 - Replacement, improvement, & new capability
- **Total Experimental Operations \approx 17 M\$**

Project Schedule



Funding Profile

- No inflation adjustments have been made
- Construction Period
 - Somewhat optimistic – 7 year schedule more probable
 - Assume that operations at significant fraction of specification begins year following.

Area	Construction						Totals	Ops
	1	2	3	4	5	6		
Construction	25	69	174	172	160	95	695	
R&D	5	3	2	0	0	0	10	
Pre-Ops	0	0	20	30	40	60	150	65
Totals	30	72	196	202	200	155	855	

Total Project Cost (TPC)

- **RD ≈25 M\$**
 - **≈15 M\$ prior to construction period**
 - FY00 (≈1.75 M\$), FY01 (≈3.5 M\$), & FY02 (≈6.25 M\$)
 - **≈10 M\$ during construction period**
- **Pre-CDR, CDR, DOE required analyses ≈15 M\$**
- **TEC ≈695 M\$**
- **Pre-ops ≈150 M\$**
- **TPC ≈885 M\$**